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Patent Claims

1. A coolant circuit of a motor vehicle, comprising  
1.1 a coolant, especially water or a water mixture;  
1.2 a coolant pump (1) having a coolant outlet (1.1);  
1.3 a retarder (2) which has a central ring (2.1), the working medium of which is the coolant;  
1.4 a reversing valve (3) in the flow direction upstream of the retarder (2) and a bypass section (4) for bypassing the retarder (2), such that the retarder (2) can be connected to and disconnected from the coolant circuit, whereby the coolant pump (1) is arranged in the flow direction upstream of the retarder (2) in such a way that it pumps coolant into the retarder (2) when the retarder (2) is connected and pumps coolant past the retarder (2) via the bypass section (4) when the retarder (2) is disconnected;  
1.5 characterized by the following feature:  
1.6 when the retarder is connected, the total flow resistance from the outlet (1.1) of the coolant pump (1) to the central ring (2.1) of the retarder (2) is lower than the total flow resistance of the coolant circuit to be overcome by the coolant pump (1) in the non-braking mode.
2. The coolant circuit according to claim 1, further characterized in that, when the retarder is connected, the total flow resistance from the outlet (1.1) of the coolant pump (1) to the central ring (2.1) of the retarder (2) is lower by 5 percent to 30 percent than the total resistance to flow of the coolant circuit to be overcome by the coolant pump (1) in the non-braking mode.
3. The coolant circuit according to either claim 1 or 2, further characterized in that, when the retarder is connected, the coolant pump (1), the reversing valve (3), and the retarder (2) are arranged in the coolant circuit in the given order in the flow direction one directly after the other.

4. The coolant circuit according to either claim 1 or 2, further characterized in that, when the retarder (2) is connected, an engine (5) that is to be cooled, particularly an internal combustion engine, is arranged in the coolant circuit in the flow direction upstream of the retarder (2) and downstream of the coolant pump (1).
5. The coolant circuit according to one of claims 1 to 3, further characterized in that, when the retarder (2) is connected, an engine (5) that is to be cooled, particularly an internal combustion engine, is arranged in the coolant circuit in the flow direction downstream of the retarder (2) and upstream of the coolant pump (1).
6. The coolant circuit according to one of claims 1 to 5, further characterized in that the retarder (2) is a secondary retarder.
7. The coolant circuit according to one of claims 1 to 6, further characterized in that the reversing valve (3) is constructed as a rotary slide valve, which
  - 7.1 comprises one inlet (3.1) and two outlets (3.2, 3.3) and
  - 7.2 has a cylindrical valve piston (3.4) that can rotate around its longitudinal axis, which
  - 7.3 comprises an outlet hole (3.5), which is incorporated into the valve piston (3.4) in the radial direction and which can be aligned in a flush manner with each of the outlets (3.2, 3.3) by rotating the valve piston; and, in addition,
  - 7.4 an inlet hole (3.6), which is incorporated in the valve piston (3.4) in the radial direction and is connected to the outlet hole (3.5) in a flow-carrying manner, whereby
  - 7.5 the inlet hole (3.6) has a construction that is conically tapering proceeding radially from the outside to the inside, whereby the radial outer opening surface has a diameter that is enlarged in such a way that, regardless of the alignment of the outlet hole (3.5) with an outlet (3.2, 3.3), there is a constant flow-carrying connection to the inlet (3.1).

8. The coolant circuit according to one of claims 1 to 7, further characterized in that the stator (2.2) of the retarder (2) has holes (2.3) for introducing working medium into the working chamber (2.4) of the retarder (2) and is provided on its working medium inlet side (2.5), over its entire circumference, with guide elements (2.6), particularly ribs, for the uniform distribution of the working medium over the stator circumference.
9. The coolant circuit according to one of claims 1 to 8, further characterized in that the stator (2.2) of the retarder (2) has holes (2.3) for introducing working medium into the working chamber (2.4) of the retarder (2), the holes (2.3) being conically enlarged in the flow direction.
10. The coolant circuit according to one of claims 1 to 8, further characterized in that the stator (2.2) of the retarder (2) has holes (2.3) for introducing working medium into the working chamber (2.4) of the retarder (2) that are constructed in a plurality of predetermined blades (2.7), several holes (2.3), particularly parallel holes, being provided for each blade (2.7) with holes.